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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/649,569	08/28/2000	Satyadev R. Patel	P6-US	1795
26148	7590	09/02/2004	EXAMINER	
REFLECTIVITY, INC. 350 POTRERO AVENUE SUNNYVALE, CA 94085			OLSEN, ALLAN W	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 09/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/649,569

Applicant(s)

PATEL ET AL.

Examiner

Allan Olsen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 and 45-89 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29, 36-41 and 44-89 is/are rejected.
- 7) ☒ Claim(s) 30-35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

Applicant is advised that the Notice of Allowance mailed October 2, 2003 is vacated. If the issue fee has already been paid, applicant may request a refund or request that the fee be credited to a deposit account. However, applicant may wait until the application is either found allowable or held abandoned. If allowed, upon receipt of a new Notice of Allowance, applicant may request that the previously submitted issue fee be applied. If abandoned, applicant may request refund or credit to a specified Deposit Account.

The allowance is withdrawn in view of the following rejections based upon the newly discovered reference to Guilmette et al., U. S. Patent 4,551,197.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6, 7, 10, 11, 16, 17, 22-28, 36, 38, 47-49, 51-59, 61-72, 74, 75 and 77-81 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,551,197 issued to Guilmette et al. (hereinafter, Guilmette).

Guilmette teaches a method and apparatus for etching substrate, for example a silicon-containing semiconductor workpiece. Guilmette teaches etching with XeF₂.

Guilmette teaches a cryogenic pumping method to recover and recirculate the unused

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portion of the etchant gas. Guilmette teaches repeated recirculation of the etchant with a cryogenic pumping system that comprises three traps, each of which are cycled through a temperature range to facilitate the condensation, vaporization and transportation of the etchant through the etchant chamber. XeF_2 inherently comprises a mixture of Xe and XeF_2 (see column 3, lines 54-56 of US 4,190,488 (Winters)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 18-21, 50 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guilmette.

The above noted teachings of Guilmette are herein relied upon. Additionally it is noted that Guilmette teaches cooling the traps with liquid nitrogen, which has a temperature of -196°C .

Guilmette does not teach adding an inert gas diluent. Guilmette does not teach the provision of a filter in the recirculation loop. Guilmette does not teach maintaining the traps/source chambers at a temperature under 40°C .

It would have been obvious for one skilled in the art to add an inert gas diluent, for example, He or Ne, as the use of such diluents is commonly practiced because it widely recognized the inclusion of a diluent provides greater control over the process.

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When raising the temperature of the traps from 196° C it would be obvious to one skilled in the art to raise the temperature only enough to allow for the transportation of XeF₂ because maintaining a cold trap would effectively remove impurities from the recirculation loop. In this capacity the cold trap is in essence functioning as a filter.

Claims 15 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guilmette, as applied to claim 1 above, in view of U. S. Patent 4,190,488 issued to Winters.

Guilmette does not teach cooling the sample. Guilmette does not teach that the apparatus comprises an energy source or electric field source at the etching chamber to form a plasma.

Guilmette's disclosure principally concerns the recovery and reuse of XeF₂. With Guilmette's focus being on the recovery and reuse of XeF₂, the manner in which the XeF₂ is used in the actual etching process is not discussed. However, Guilmette cites Winter's process as one that can benefit from Guilmette's recovery and reuse process (column 1, lines 12-30).

Winter teaches cooling the sample and Winter teaches etching with a XeF₂ plasma (see claim 14).

It would have been obvious to one skilled in the art to use Guilmette's process in conjunction with the plasma etching of a cooled substrate chamber because Guilmette cites Winter's process as one that can benefit from a Guilmette's method and Winter teaches plasma processing of substrate below room temperature.

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Claims 5, 12-14, 39-41, 50 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guilmette in view of U. S. Patent 4,891,087 issued to Davis et al. (hereinafter, Davis).

The above noted teachings of Guilmette are herein relied upon.

Guilmette does not teach the presence of gas distribution components such as a baffle or a perforated plate or the inclusion of a filter component.

Davis teaches a gas distribution system that includes a filter.

It would have been obvious to one skilled in the art at the time the invention was made to use a gas distribution system and filter to realize Davis' mixing of gases and uniformity of contact between the gas mixture and the substrate. Also Davis teaches that the plurality of holes through which the gas passes provides a means of controlling the temperature. See: column 4, line 50; column 9, line 63- column 11, line 7; column 15, lines 5-18).

Claims 37, 82, 83 and 85-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guilmette in view of U. S. Patent 6,162,367 issued to Tai et al. (hereinafter, Tai).

The above noted teachings of Guilmette are herein relied upon.

Guilmette does not teach the use of BrF_3 or the fabrication of a MEMS device.

It would have been obvious to one skilled in the art to replace XeF_2 with BrF_3 because Tai teaches they are functionally equivalent with respect to their ability to etch silicon. It would be obvious to use the combination of Guilmette/Tai combination in a method that is directed to the fabrication of a MEMS device because Guilmette is directed to the recovery and recycling aspect alone. That is, Guilmette is not directed to

a particular type of etching process or specific type of product whereas Tai teaches the utility of the etching process for the fabrication of MEMS devices.

Claims 8, 9, 45, 46, 76 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guilmette and Davis as applied above in view of U. S. Patent 4,910,153 issued to Dickson.

The above noted teachings of Guilmette and Davis are herein relied upon.

The Guilmette/Davis combination does not teach the use of bellows pump.

Dickson teaches the use of bellows pump.

It would have been obvious to one skilled in the art to use a bellows pump because Dickson teaches that conventional bellows pumps are for recirculation of gases.

Allowable Subject Matter

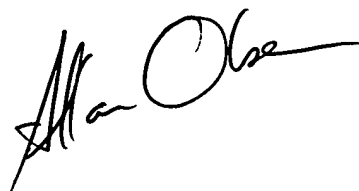
Claims 30-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 571-272-1441. The examiner can normally be reached on M-F 1-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Mills can be reached on 571-272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Allan Olsen", with a stylized flourish at the end.

Allan Olsen
Primary Examiner
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